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Two Recent Developments in Veterinary Therapeutics*

James A. Austin

HYPERSENSITIVENESS in human beings has been recognized since before the time of Christ. Lucretius, living in about the first century B. C., is credited with the statement "One man's meat is another man's poison" (1). Detailed directions were given in the second century for the treatment of egg hypersensitiveness of the gastrointestinal tract. No significant advances were made either in determining the cause or the treatment of this condition until the beginning of the twentieth century.

In 1902 the term anaphylaxis was coined to describe a condition observed in animals and in 1904 Theobald Smith made the important observation that guinea pigs could be easily sensitized and thus provided a laboratory animal for experimental use. In 1910 Barger & Dale isolated histamine from ergot (2) and Dale was led to believe that the pharmacological effects of histamine in animals resembled those seen in anaphylactic shock.

During the next few years considerable work was done to establish a definite relationship between histamine and anaphylactic shock and this was shown in 1936 when Dragstedt and Mead (3) found histamine in the inferior vena cava of a dog in anaphylactic shock in amounts similar to those required to produce the same changes by intravenous injection. It was then postulated that histamine is released from the tissues during the antigen-antibody reaction and this led to intensive research for some product that would antagonize or inactivate the histamine. Histamine in dogs is evidenced by spasm of hepatic veins, fall of blood pressure, increased capillary permeability, diarrhea, salivation, increased peristalsis, stimulation of smooth muscle directly and urticaria. The chief effect in horses and cattle is a diarrhea.

Fell (4) attempted to accomplish inactivation of histamine by conjugating histamine with a portein so that it would stimulate antibody production against the histamine portion of the molecule when injected into animals. This preparation did not prove satisfactory in treatment although it is still used in some cases. Best (5) then announced the isolation of an enzyme, histaminase, from animal tissues and believed that this preparation would solve the problem in allergic reactions. However, clinical experience did not substantiate this.

The first new compounds that antagonized histamine and allayed allergic reactions were synthesized in France and this was followed by many compounds synthesized in this country. At the present time we have three outstanding antihistamines, "Benadryl," "Pyribenzamine" and "Decapryn" ("A-H Tabs"). The use of these drugs in animals has not kept pace with the human field possibly because many conditions seen in animals were not

* Excerpts from a paper presented at a meeting of the Kansas Veterinary Association. Mr. Austin is a chemist for Jensen-Salsbery Laboratories, Kansas City, Missouri.

recognized as allergic reactions; however, the veterinarian should familiarize himself with these products as they will prove helpful in many cases. It must be emphasized that the antihistamines do not destroy histamine but compete with it for sites on effector cells and thus block its physiological action.

Urticaria in dogs may be quickly relieved by 50 mg. of an antihistamine orally and the edematous swelling usually recedes in 30 minutes. Allergic dermatitis in dogs may be treated with 50 mg. or less of the drug three times daily. Coughs due to asthma may be relieved by the same dosage. Many cases of eczema respond to antihistamine treatment. The dosage for dogs is from 25 to 75 mg. one to three times daily depending on results obtained. Large animals may be given 25 to 50 mg. per 100 lbs. of body weight in laminitis, azoturia and food allergy of horses. Stomatitis, pulmonary edema and acute diarrhea of cattle may be treated similarly. Large animals may best be treated by intravenous use of the antihistamine. Intravenous injections must be made slowly as these drugs are very powerful and nervous symptoms may appear during the injection. For this reason it is advisable to start with a small dose and gradually increase it until the desired results are obtained.

As with most active therapeutic agents, the antihistamines produce some side reactions that may cause alarm unless these are recognized as an effect associated with the drug. These side reactions usually subside in 10 to 30 minutes. In dogs vomiting or nervousness may be seen. Cats do not seem to tolerate the antihistamines so should not be treated with this class of substances.

The following side effects have been reported in large animals: nervousness and excitability, muscular trembling, salivation, bellowing in cattle and twitching of the lower lip in horses.

It must be emphasized that the antihistamines are antagonists to histamine and as such must be given as long as evidences of histamine action are observed. They must not be considered as agents that prevent the liberation of histamine.

Surface Tension Increasants

The cause and treatment of bloat in ruminants has been the subject of many investigations and volumes have been written on both aspects of this problem. In "frothy" or "foamy" bloats one finds a huge mass of material in which is dispersed tiny bubbles of gas. These gases are the result of fermentation or predigestion of the food mass, particularly cellulose, and consist of carbon dioxide, hydrogen sulfide, methane, nitrogen and hydrogen. In a normal animal these gases are expelled by eructation and cause no trouble but in some cases they are entrapped or dispersed in the food mass and are not expelled. This situation may be illustrated by observing the "foam" produced when one stirs a water solution of some of the powders advertised for washing dishes.

This foam consists of tiny bubbles of air dispersed in the liquid phase. Actually each small "particle" of air is surrounded by a film of the solution. Attempts to break this film to release the air only results in producing more "coated bubbles." A substance which produces this condition is called a surface tension depressant. The situation in "frothy" or "foamy bloat" is analagous to this; the gases formed are dispersed in the food mass because of the low surface tension of that mass.

These bloat cases are sometimes treated with antiferments but consideration will show that they only partially solve the problem. The antiferment may reduce the production of additional gas by inhibiting the fermentive process but will do little to release the gas dispersed in the mass of the rumen.

Clark and Quin (6) in South Africa called attention to the surface tension effect as perhaps being a factor in this condition. A search was initiated for a product that would increase the surface tension of the rumen contents, or reverse the condition responsible for this condition and break the films around the gas particles, thus releasing the gases for expulsion in the normal manner (7). Experimental work indicated that a high-

ly polymerized methyl silicone was satisfactory for this purpose and clinical investigations were first carried out on a tablet which was to be crushed and given as a drench. Reports on over 100 cases indicated an efficiency of 79 percent. Later clinical investigations were made with a suspension of the active material and effictiveness of treatment rose to 95.2 percent.

The last 15 years has seen a tremendous advance in research in these cases and therapeutic agents to combat them. Out of this research has come a great many new compounds designed to do a particular job in the animal organism and the dream of Ehrlich that therapeutic agents could be found that would be highly specific in treating diseases is nearer realization.

References

1. Urbach, E. and Gottleib, P. M. Allergy. Green and Stratton (1946).
2. Barger, G. and Cale, H. H. J. Phys: 40:38 (1910).
3. Dragstedt, C. and Meade, F. B. J. Pharm. 57:419 (1936).
4. Fell, N. **et al.** J. Pharm. 47:237 (1943).
5. Best, C. H. J. Phys. 67:256 (1929).
6. Clark, R. and Quin, J. L. J. Onderstpt. 20.2.
7. Quin, A. H., Austin, J. A. and Ratcliff, K. A. J.A.V.M.A. 114:313 (1949). Jen-Sal Journal 32:2 (1949).

The Young Veterinarian

Did you ever hear the story of our good friend Doctor John?
If you ever hear one better, you will have to rise ere dawn.
Seems a farmer had some piglets that were ruptured in the rear
And he wished to save the critters, for the price of pork was dear.
So he went to see the doctor. Went to see young Doctor John,
And he took him to the pig pen and the conquest, then, was on.

Doctor made examination, and he said, "It's plain to me
That we cut the piggie open and then sew him up, you see."
And the farmer told the doctor, as he looked him in the face,
"Just proceed with your procedure, for this is the time and place."
So, the farmer caught the piglet and the doctor got his knife
And they started in so bravely, to prolong the piggie's life.

Now, the doctor had great knowledge, but he also needed cash
So he waved his knife so proudly and he cut an awful gash.
Doc had always cut on dead ones, so the thought did not occur
That the pig would not enjoy it. Would not simply lie and purr.
But the pig had his ideas, and he valued high his life
And he seemed to bear resentment toward that wicked-looking knife.

So, he used his little kickers and he made a sudden rush
Scattered casing for the sausage, all around among the brush.
But the farmer spied the piglet, as he vanished o'er the hill
And he took from out a bottle, a new kind of pepping pill.
After gulping half a dozen and regaining so much pep
He pursued the little piglet, gaining on him every step.

While the farmer chased the piglet, Doctor John did wonder why
This poor pig would act so strangely, and did seem to want to die.
Had he waited fifteen minutes for the needle and the thread
Odds woud then be in his favor that the pig need not be dead.
As the doctor turned this over in his ever-active mind
The farmer parted clover, with the little pig behind.

"Casings for the sausage? They are gone." The Doctor said,
"But they pack some now in plastic," as he slowly scratched his head.
So he said unto the farmer, just as quick as any cat
"I've decided, Mr. Farmer, we'll dispense with with all of that."
So, he took his rusty needle and a bunch of knotted thread
And he sewed the little piglet. Sewed it up from tail to head.

We concede this operation might have been a little crude
And the treatment of the piglet was indeed—well, rather rude.
But it gave the doctor practice and it also brought him fame
And as best I can explain it, did immortalize his name.
For the pig survived the treatment and he soon grew strong and well,
Or at least this is the story that the neighbor farmers tell.

—James M. Findley